Challenges and Future Directions of Big Data and Artificial Intelligence in Education

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Abstract

We discuss the new challenges and directions facing the use of big data and artificial intelligence (AI) in education research, policy-making, and industry. In recent years, applications of big data and AI in education have made significant headways. This highlights a novel trend in leading-edge educational research. The convenience and embeddedness of data collection within educational technologies, paired with computational techniques have made the analyses of big data a reality. We are moving beyond proof-of-concept demonstrations and applications of techniques, and are beginning to see substantial adoption in many areas of education. The key research trends in the domains of big data and AI are associated with assessment, individualized learning, and precision education. Model-driven data analytics approaches will grow quickly to guide the development, interpretation, and validation of the algorithms. However, conclusions from educational analytics should, of course, be applied with caution. At the education policy level, the government should be devoted to supporting lifelong learning, offering teacher education programs, and protecting personal data. With regard to the education industry, reciprocal and mutually beneficial relationships should be developed in order to enhance academia-industry collaboration. Furthermore, it is important to make sure that technologies are guided by relevant theoretical frameworks and are empirically tested. Lastly, in this paper we advocate an in-depth dialog between supporters of “cold” technology and “warm” humanity so that it can lead to greater understanding among teachers and students about how technology, and specifically, the big data explosion and AI revolution can bring new opportunities (and challenges) that can be best leveraged for pedagogical practices and learning.